

Level Measurement

Point level measurement

Vibrating switches

SITRANS LVS300

Overview



SITRANS LVS300 is a vibrating rod point level switch for high, low, or demand level detection of bulk solids.

Application

The standard LVS300 detects high, low, or demand levels of dry bulk solids in bins, silos, or hoppers.

A pipe extension version is available, separated by a customer supplied 1 inch pipe.

The LVS300 has a compact design and can be top, side or angle mounted. The vibrating rod design ensures the product will not be impacted by bridging of traditional forks in applications with buildup potential. A durable probe design ensures the product will withstand heavier materials without damage or bending.

A signal from the electronic circuit excites a crystal in the probe causing the rod to vibrate. If the rod is covered by material, the change in vibration is detected by the electronic circuitry which causes the output to change state after a one second delay. When the probe is free from material, full vibration resumes and the relay reverts to its normal condition.

- Key Applications: dry or bulk solids with buildup potential, in bins, silos, or hoppers, such as lime, molding sand, milk powder, flour, salt, and plastic granules.

Benefits

- High resistance to mechanical forces.
- Adjustable sensitivity for varied applications including build-up.
- Rotatable enclosure for convenient wiring.
- Suitable for low density material: standard version, 20 g/l (1.3 lb/ft³).
- Customer desired extensions up to 4 000 mm (157 inch).
- 160 mm (6.3 inch) insertion length.
- Flexible, customer supplied, rods to 4 meters.
- Process connections starting at 1 inch.

Technical specifications

Mode of operation		Rated operating conditions	
Measuring principle	Vibrating point level switch	Installation conditions	Indoor/outdoor
Input		• Location	
Measured variable	High, low, and demand	Ambient conditions	
Measuring frequency		• Ambient temperature	-40 ... +60 °C (-40 ... +140 °F)
• Standard	330 Hz	• Installation category	II
Output		• Pollution degree	2
PNP	Open collector: Permanent load max. 0.4 A, short-circuit and overload protected (reverse protection)	Medium conditions	
Relay	DPDT relay	• Process temperature	-40 ... +150 °C (-40 ... +302 °F)
Signal delay	• Probe uncovered to covered: approximately 1 second • Probe covered to uncovered: approximately 1 ... 2 seconds	• Pressure (vessel)	Max. 16 bar g (232 psi g) European Pressure Directive 2014/68/EU: Category 1
Relay fail-safe	High or low, switch selectable	• Minimum material density	Approx. 20 g/l (1.2 lb/ft ³)
Alarm output	• Relay 8 A at 250 V AC, non-inductive • Relay 5 A at 30 V DC, non-inductive	Design	
Sensitivity		Material	Aluminum powder coat
		• Enclosure	
		Process connection	• G 1", G 1 1/4", G 1 1/2" DIN 228; NPT 1", NPT 1 1/4", NPT 1 1/2" ANSI B 1.20.1 • Flange: according to selection 1.4541 (321) or 1.4404 (316L) • Tri-clamp: stainless steel 1.4301 (304) or 1.4404 (316L) • 2" (DN 50) ISO 2852
		Probe material	• Oscillator material: stainless steel 1.4404 (316L) • Stainless steel 1.4301 (304)/1.4541 (321) or 1.4404 (316L) (process connection and tube extension)
		Degree of protection	IP67 (EN 60529), NEMA Type 4X
		Conduit entry	2 x M20 x 1.5 or 2 x 1/2" NPT
		Weight	• Standard version: 1.3 kg (2.9 lb) +1.3 kg/m (+2.9 lb per 39.3 inch) extension • Customer supplied pipe: 1.8 kg (4.0 lb) +1.3 kg/m (+2.9 lb per 39.3 inch) extension
		Power supply	
		• Relay DPDT 21 ... 230 V, 50 ... 60 Hz, ± 10 %* 22 VA, 22 ... 45 V DC, ± 10 %* 2W *incl. ± 10 % of EN 61010 • 3-wire PNP 20 ... 40 V DC, ± 10 %* *incl. ± 10 % of EN 61010	
		Certificates and approvals	
		CE, ATEX	

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Selection and Ordering data	Article No.
SITRANS LVS300 Vibrating rod point level switch, compact design Level and material detection in solids. Compact, with 160 mm (6.30 inch) insertion.	7ML5736-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Power supply Relays DPDT 21 ... 230 V AC 22 ... 45 V DC PNP 20 ... 40 V DC	1 2
Process temperature Without temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb < 40 °C (104 °F)] With temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]	A B
Process connection <u>Threaded</u> Thread G 1½" (BSPP) EN ISO 228-1 Thread G 1¼" (BSPP) EN ISO 228-1 Thread G 1" (BSPP) EN ISO 228-1 Thread NPT 1½" (Taper) ANSI B1.20.1 Thread NPT 1¼" (Taper) ANSI B1.20.1 Thread NPT 1" (Taper) ANSI B1.20.1 Triclamp 2" (DN 50) ISO 2852 <u>Flanged</u> Flange DN 100 PN6, EN1092-1 ¹⁾ Flange DN 100 PN16, EN1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	A B C D E F G H J K L M
Extension length Standard length, 160 mm (6.3 inch)	1 1
Material process connection/extension Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) Stainless steel 316 L (1.4404)	1 2
Approvals CE ATEX II 1/2D Ex ta/tb IIIC TI Da/Db IP6X	A B

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [(70 mm x 13 mm (2.76 x 0.51 inch)): Measuring-point number/identification (max. 27 characters) specify in plain text	Y14
Signal bulb inserted in M20 cable gland ²⁾	A20
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	

1) Max. 6 bar (87 psi).

2) Available only with Approval option A.

Selection and Ordering data	Article No.
SITRANS LVS300 Vibrating rod point level switch, pipe extended design Level and material detection in solids. Extension options up to 4 m (13.12 ft).	7ML5737-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Power supply Relays DPDT 21 ... 230 V AC 22 ... 45 V DC PNP 20 ... 40 V DC	1 2
Process temperature Without temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb < 40 °C (104 °F)] With temperature isolator [up to Tprocess = 150 °C (302 °F) at Tamb > 40 °C (104 °F)]	A B
Process connection <u>Threaded</u> Thread G 1½" (BSPP) EN ISO 228-1 Thread G 1¼" (BSPP) EN ISO 228-1 Thread G 1" (BSPP) EN ISO 228-1 Thread NPT 1½" (Taper) ANSI B1.20.1 Thread NPT 1¼" (Taper) ANSI B1.20.1 Thread NPT 1" (Taper) ANSI B1.20.1 Tri-clamp 2" (DN50) ISO 2852 <u>Flanged</u> Flange DN 100 PN6, EN1092-1 ¹⁾ Flange DN 100 PN16, EN1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	A B C D E F G H J K L M
Extension length <u>Extension length Stainless steel threads</u> 304 (1.4301), flanges 321 (1.4541) 200 ... 500 mm (7.87 ... 19.69 inch) 501 ... 750 mm (19.72 ... 29.53 inch) 751 ... 1 000 mm (29.57 ... 39.37 inch) 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 3 751 ... 4 000 mm (147.68 ... 157.48 inch) <u>Extension length Stainless steel 316 L (1.4404)</u> 200 ... 500 mm (7.87 ... 19.69 inch) 501 ... 750 mm (19.72 ... 29.53 inch) 751 ... 1 000 mm (29.57 ... 39.37 inch) 1 001 ... 1 250 mm (39.41 ... 49.21 inch) 1 251 ... 1 500 mm (49.25 ... 59.06 inch) 1 501 ... 1 750 mm (59.09 ... 68.90 inch) 1 751 ... 2 000 mm (68.94 ... 78.74 inch) 2 001 ... 2 250 mm (78.78 ... 88.58 inch) 2 251 ... 2 500 mm (88.62 ... 98.43 inch) 2 501 ... 2 750 mm (98.46 ... 108.27 inch) 2 751 ... 3 000 mm (108.31 ... 118.11 inch) 3 001 ... 3 250 mm (118.15 ... 127.95 inch) 3 251 ... 3 500 mm (127.99 ... 137.80 inch) 3 501 ... 3 750 mm (137.83 ... 147.64 inch) 3 751 ... 4 000 mm (147.68 ... 157.48 inch)	1 2 1 3 1 4 1 5 1 6 1 7 1 8 2 1 2 2 2 3 2 4 2 5 2 6 2 7 2 8 4 2 4 3 4 4 4 5 4 6 4 7 4 8 5 1 5 2 5 3 5 4 5 5 5 6 5 7 5 8

Selection and Ordering data	Article No.
SITRANS LVS300 Vibrating rod point level switch, pipe extended design Level and material detection in solids. Extension options up to 4 m (13.12 ft).	7ML5737- 
Material process connection/extension Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) ²⁾ Stainless steel 316 L (1.4404) ³⁾	1 2
Approvals CE ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X	A B

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Enter the total insertion length in plain text description, max. 4 000 mm (157.48 inch)	Y01
Stainless steel tag [(70 mm x 13 mm (2.76 x 0.51 inch)): Measuring-point number/identification (max. 27 characters) specify in plain text	Y14
Signal bulb inserted in M20 cable gland ⁴⁾	A20
Sliding sleeve, for application without overpressure max. 150 °C (302 °F), min. length 501 mm (19.72 inch) ⁵⁾⁶⁾	P12
Sliding sleeve, for application with overpressure, max. 16 bar (232 psi), max. 150 °C (302 °F), min. length 501 mm (19.72 inch) ⁶⁾	P13
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Spare parts Replacement Electronics Modules are available. Contact factory for pricing.	

¹⁾ Max. 6 bar (87 psi).

²⁾ Available with extension length 12.

³⁾ Available with extension length 42.

⁴⁾ Available only with Approval option A.

⁵⁾ Available only with Approval options A and C.

⁶⁾ Available only with Process connection options A, D, H, J, K, L, M, not available with extension length 12 and 42.

⁷⁾ Available only with Material Process connection/extension option 1.

Selection and Ordering data	Article No.
SITRANS LVS300 Vibrating rod point level switch, customer supplied tube Level and material detection in solids. Requires flexible, customer supplied, pipe extensions with insertion to 4 m (13.12 ft).	7ML5738- 
 Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Power supply Relays DPDT 21 ... 230 V AC 22 ... 45 V DC PNP 20 ... 40 V DC	1 2
Process temperature Without temperature isolator [up to T _{process} = 150 °C (302 °F) at Tamb < 40 °C (104 °F)]	A
Process connection Threaded Thread G 1½ " (BSPP) EN ISO 228-1 Thread NPT 1½ " (Taper) ANSI B1.20.1 Tri-clamp 2" (DN 50) ISO 2852 Flanged Flange DN 100 PN6, EN1092-1 ¹⁾ Flange DN 100 PN16, EN1092-1 2" ASME 150 lb B16.5 3" ASME 150 lb B16.5 4" ASME 150 lb B16.5	A D G H J K L M
Extension length 1 500 mm (59 inch), adjustable cable length 4 000 mm (157 inch), adjustable cable length	1 1 1 2
Material process connection/extension Stainless steel threads 304 (1.4301), flanges 321 (1.4541), Tri-clamp 304 (1.4301) Stainless steel 316 L (1.4404)	1 2
Approvals CE ATEX II 1/2D Ex ta/tb IIIC T! Da/Db IP6X	A B

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code(s).	
Stainless steel tag [(70 mm x 13 mm (2.76 x 0.51 inch)): Measuring-point number/identification (max. 27 characters) specify in plain text	Y14
Signal bulb inserted in M20 cable gland ²⁾	A20
Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Spare parts Replacement Electronics Modules are available. Contact factory for pricing.	

¹⁾ Max. 6 bar (87 psi).

²⁾ Available only with Approval option A.

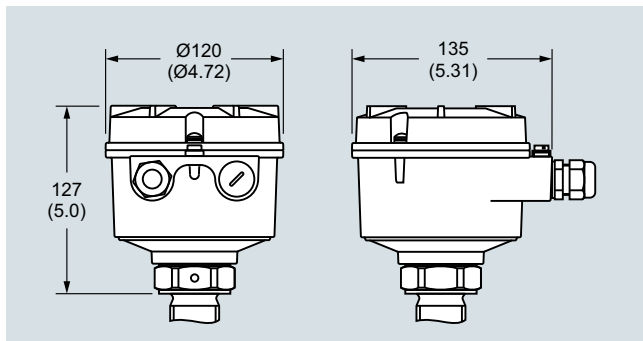
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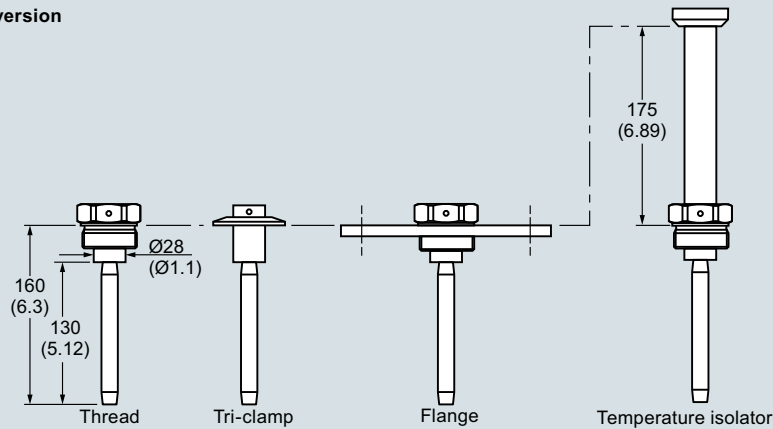
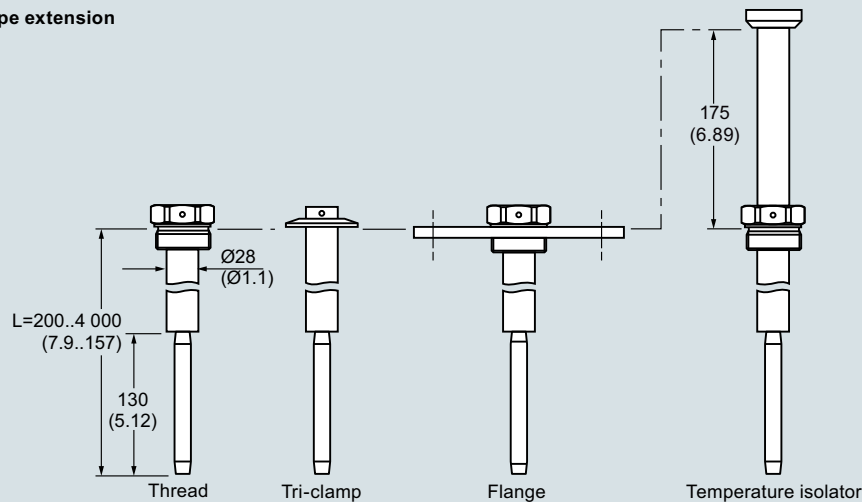
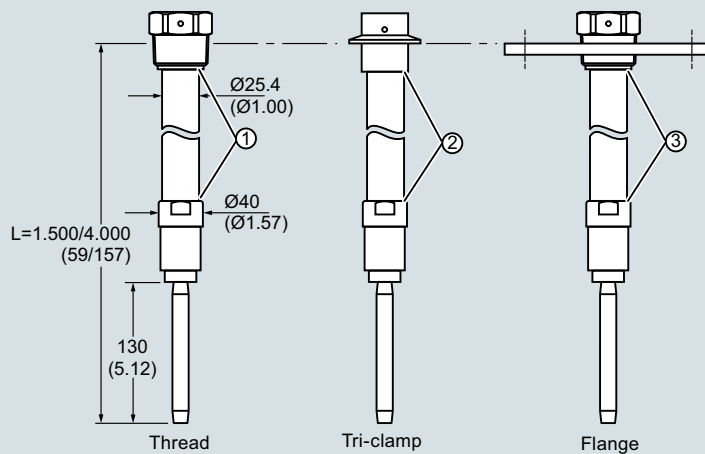
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Dimensional drawings



SITRANS LVS300 enclosure, dimensions in mm (inch)

Compact version**Pipe extension****Pipe extension - customer mounted**

①	Approval	Process connection	Thread on extension pipe
	CE, ATEX	G 1½"	R 1"
	FM	NPT 1½"	NPT 1"
②	Approval	Thread on extension pipe	
	CE, ATEX	R 1"	
	FM	NPT 1"	
③	Approval	Process connection	Thread on extension pipe
	CE, ATEX	Flange DN	R 1"
		Flange ANSI	NPT 1"
	FM	Flange DN	NPT 1"
		Flange ANSI	NPT 1"

SITRANS LVS300, dimensions in mm (inch)

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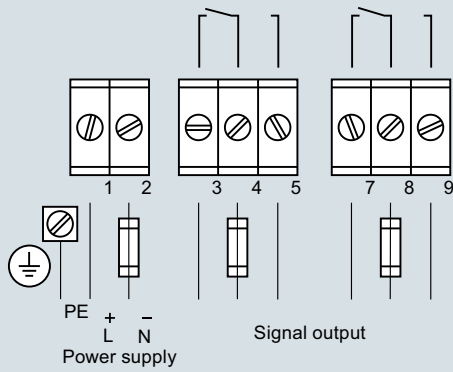
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Circuit diagrams

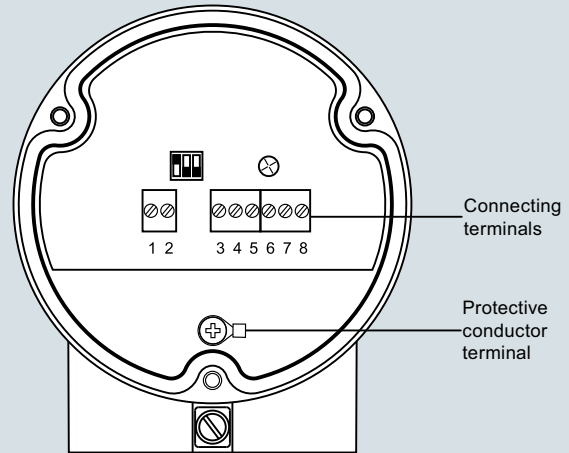
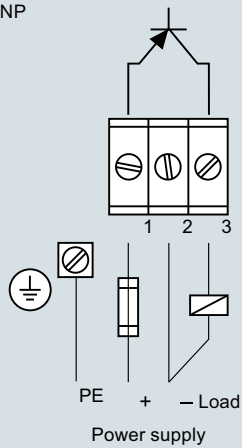
Universal voltage

Relay DPDT



3-wire

PNP



SITRANS LVS300 connections